

Claims

1. Method for hydration of a particulate or pulverulent material containing CaO,
characterized in that water is added in a quantity which will ensure that the partial
5 pressure P_{H_2O} of the added water as a function of the temperature ($^{\circ}\text{C}$) is maintained
within the interval defined by the formula

$$6,85 - \frac{5459}{(T + 273)} < \log P_{H_2O} < 5,45 - \frac{2032}{(T + 273)},$$

where P_{H_2O} is the partial pressure of water vapour in atm. and T is the temperature in $^{\circ}\text{C}$.

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2. Method according to claim 1, **characterized in** that that the material containing CaO as
well as the water are introduced into an upper end of a vertical reactor, directed down
through the latter subject to simultaneous vaporization and hydration, and that the
hydrated product is discharged from the reactor at a lower end hereof.

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3. Method according to claim 1, **characterized in** that the material containing CaO is
introduced into an upper end of a vertical reactor, directed down through the latter subject
to simultaneous hydration with water which is introduced at a number of locations
distributed across the height of the reactor, where any surplus water in vapour form is
20 discharged through an opening in the upper end of the reactor and where the hydrated
product is discharged from the reactor from a lower end hereof.

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4. Method according to claim 1, 2 or 3, **characterized in** that the temperature during the
hydration process is maintained at a level above 100°C , preferably above 200°C and
most preferably above 250°C .

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5. Method according to claim 1, 2 or 3, **characterized in** that the partial pressure of the
water vapour is maintained within the interval 0.01 to 10 atm., preferably within the
interval 0.1 to 2 atm, most preferably within the interval 0.9 to 1.1 atm.

6. Method according to any of the claims 1-5, **characterized in** that some of the hydrated product is recirculated to the hydration unit.

7. Method according to any of the claims 1-6, **characterized in** that hydration is confined
5 to the surface of the material particles.

8. Method according to claim 7, **characterized in** that the degree of hydration is less than 70 %, preferably less than 50 %..

10 9. Method according to any of the claims 1-8, **characterized in** that the material containing CaO in the form of calcined raw meal is extracted from the calciner of a cement manufacturing plant.

15 10. Method according to claim 9, **characterized in** that the hydrated product subsequently is re-introduced into the preheater of the cement manufacturing plant immediately after the location, viewed in the direction of movement of the exhaust gases, where SO₂ is formed in order to absorb SO₂.

20 11. Apparatus for carrying out the method according to claim 2, **characterized in** that it comprises a vertical reactor (6a) incorporating an upper end and a lower end, means (6b, 6c) at the upper end of the reactor for introducing material containing CaO and water either collectively or separately, and means (6d, 6e) at the lower end of the reactor for discharging the hydrated product.

25 12. Apparatus for carrying out the method according to claim 3, **characterized in** that it comprises a vertical reactor (6a) incorporating an upper end and a lower end, means (6b) at the upper end of the reactor for introducing material containing CaO, means (6f) in the upper end of the reactor for discharging any surplus water in vapour form, means (6c) provided across the height of the reactor for introducing water into the reactor, and means
30 (12) at the lower end of the reactor for discharging the hydrated product.

13. Product provided by the method according any of the claims 1-10.

14. Use of the product provided by the method according any of the claims 1-10 for reducing the SO₂ discharge from a kiln plant.